

**ANNA UNIVERSITY
Tiruchirappalli – 24**

**CURRICULUM FOR
FIRST YEAR
B.E/B.Tech (Part Time) DEGREE COURSES**

FIRST SEMESTER

B.E. (PART TIME) ELECTRONICS AND COMMUNICATION ENGINEERING

Sl. NO.	SUBJECT	HOURS/ WEEK	L T P	MAX. MARKS
	THEORY			
1	Mathematics I	3	3 0 0	100
2	Physical Sciences	3	3 0 0	100
3	Digital Computer Principles	3	3 0 0	100
4	Electronic Devices	3	3 0 0	100
5	Measurements and Instrumentation	3	3 0 0	100
	Total	15		500

MATHEMATICS - I

UNIT – I MATRICES

(9)

Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values – Problem solving using Cayley-Hamilton theorem – Similarity transformation – Orthogonal transformation of a symmetric matrix to diagonal form – Quadratic form – Orthogonal reduction to its canonical form.

UNIT – II THREE DIMENSIONAL GEOMETRY

(9)

Angle between two lines – Coplanar lines – Shortest distance between skew lines – Equation of a sphere – Plane section of a sphere – Tangent plane – Equation of a Cone – Right circular cone.

UNIT– III DIFFERENTIAL CALCULUS

(9)

Curvature – Cartesian and Parametric Co-ordinates – Centre and Radius of curvature – Circle of curvature – Envelopes – Evolutes

UNIT – IV FUNCTIONS OF SEVERAL VARIABLES

(9)

Partial derivatives – Euler's theorem for homogeneous functions – Total derivative – Differentiation of implicit functions – Jacobians – Maxima / Minima for functions of two variables – Method of Lagrange's multipliers – Taylor's expansion.

UNIT – V ORDINARY DIFFERENTIAL EQUATIONS (ODE)

(9)

Solution of second and higher order linear ODE with constant coefficients – Simultaneous first order linear equations with constant coefficients – Linear equations of second order with variable coefficients – Cauchy's and Legendre's linear equations – Method of reduction order.

Total : 45 hours

TEXT BOOK

1. Grewal, B.S., "Higher Engineering Mathematics", Thirty eighth Edition, Khanna Publishers, New Delhi, 2005.

REFERENCES

1. Glyn James., "Advanced Modern Engineering Mathematics", Third Edition, Pearson Education Ltd, New Delhi, 2004.
2. Venkataraman. M. K., "Engineering Mathematics", Volume I and II Revised enlarged Fourth Edition, The National Publishing Company, Chennai, 2004.
3. Veerarajan. T., "Engineering Mathematics (for first year)", Fourth Edition, Tata McGraw – Hill Publishing Company Limited, New Delhi, 2005.
4. V. Sundaram, R. Balasubramanian, K.A. Lakshminarayanan, "Engineering Mathematics", Fifth Edition, Vikas Publishing house Pvt. Ltd., New Delhi, 2006.

PHYSICAL SCIENCES

UNIT – I PROPERTIES OF MATTER AND HYDRODYNAMICS (9)

Properties of matter: Stress – Strain – Hooke's Law – Types of moduli of elasticity – Torsional pendulum – Determination of Rigidity modulus of a wire – Bending of beams – Expression for bending moment – Measurement of Young's modulus by uniform and Non-uniform bending.

Hydrodynamics: Stream line flow – Turbulent flow – Poiseuille's formula for flow of liquid through a capillary tube – Determination of coefficient of viscosity of a liquid.

UNIT – II OPTICS AND PHOTOELASTICITY (9)

Interference: Air Wedge – Testing of Flat surfaces – Michelson's Interferometer – Types of fringes – Applications: Wavelength determination – Thickness of a transparent medium.

Optical Instruments: Metallurgical microscope and Scanning electron microscope – Applications.

Photo elasticity: Theory of photo elasticity – Stress optic law – Isoclinic and Isochromatic fringes - Photoelastic bench and its use.

UNIT – III SEMICONDUCTING AND SUPERCONDUCTING MATERIALS (9)

Intrinsic Semiconductor: Expressions for the carrier concentration – Calculation of density of holes and electrons - Fermi level and its variation with temperature – Determination of band gap energy.

Extrinsic Semiconductors: Carrier concentration in n-type and p-type semiconductors (no derivation - qualitative) - Variation of Fermi level with temperature and impurity concentration - Hall effect – Determination of Hall coefficient.

Super Conductors: SuperConductivity – Properties – Meissner effect – Type I and Type II Superconductors – High temperature Super conductors – Applications – Magnetic levitation – Josephson effect - SQUID

UNIT - IV WATER TREATMENT PROCESS (9)

Hardness of water - CaCO_3 equivalents – Ethylene Diamine Tetra-acetic Acid (EDTA) method of estimation of hardness – Troubles of boiler feed water - Demineralization - Zeolite process – Desalination - Reverse osmosis - Electro

dialysis - Water conditioning (Colloidal, Phosphate, Calgon, Carbonate) - Treatment of domestic water (UV and ozone).

UNIT - V THERMODYNAMICS

(9)

Thermodynamic processes – First law of thermodynamics – Limitations - Second law of thermodynamics - Clausius and Kelvin statement – Entropy - Mathematical expressions - Changes in entropy for isothermal expansion - Reversible and irreversible processes - Free energy - Gibbs Helmholtz equation – Application and simple problems – Van't Hoff isotherm and isochore - Simple problems.

Total : 45 hours

TEXT BOOK:

1. Avadhanulu M.N. and Kshirsagar P.G., "A Text Book of Engineering Physics", S.Chand & Company Ltd., 7th Enlarged Revised Ed., 2005.
2. Gaur R.K. and Gupta S.L., "Engineering Physics", Dhanpat Rai Publishers, New Delhi, 2001.
3. P.C. Jain and Monika Jain, "Engineering Chemistry", 13th Edition, Dhanpat Rai Publishing Company (P) Ltd., New Delhi, 2004.

REFERENCE BOOKS:

1. Pillai S.O., "Solid State Physics", New Age International Publications, New Delhi, 6th Edition, 2005.
2. Arumugam M., "Engineering Physics", Anuradha Agencies, Kumbakonam, 2nd Edition, 2005.
3. Palanisamy P.K., "Physics for Engineers", Scitech Publications (India) Pvt. Ltd., Chennai, Second Edition, 2005.
4. J.C. Kuriakose and J. Rajaram, "Chemistry in Engineering and Technology", Vol.1 & 2, Tata Mcgraw Hill Publishing Company (P) Ltd., New Delhi, 1996.
5. B.K. Sharma, "Engineering Chemistry", Krishna Prakasam Media (P) Ltd., Meerut, 2001.

DIGITAL COMPUTER PRINCIPLES

UNIT - I INTRODUCTION TO COMPUTERS (9)

Digital Computer Fundamentals –Block diagram of a computer–Components of a computer system (CPU, Memory, Input/output) – Categories of Software – Booting, installing and uninstalling software – Software terminologies – Applications of Computers–Role of Information Technology–History of Internet–Internet Services

UNIT – II NUMBER SYSTEMS AND BINARY ARITHMETIC (9)

Number systems – Number Representation – Decimal, Binary, octal, Hexadecimal and BCD numbers – Binary Arithmetic – Binary addition – Arithmetic number representations – Unsigned and signed numbers – one's and two's complement – sign extended two's complement for arithmetic operations – Binary subtraction – Binary multiplication – Binary division -- Number system conversions.

UNIT - III BOOLEAN ALGEBRA AND LOGIC SIMPLIFICATION (9)

Logic operations – AND, OR, NOT, NAND, NOR, XOR and XNOR Gates – Boolean algebra Rules & Laws – Commutative, associative and distributive – De Morgan's Theorems – Standard forms of Boolean Expression - Sum of products – Product of sums –Boolean Expression Minimization using Boolean laws - Karnaugh Map Minimization for Three and four variables in SOP and POS forms – Don't care conditions – NAND and NOR implementations.

UNIT – IV COMBINATIONAL LOGIC (9)

Basic combinational logic circuits – Implementing combinational logic – Binary adder – Subtractor – Multiplier - Comparators – Encoders – Decoders – Code converters – Multiplexers – Demultiplexers – Parity generators - Read only memories – Programmable logic – Introduction to ABEL.

UNIT – V INTEGRATED CIRCUIT TECHNOLOGIES (9)

Basic operational characteristics and parameters - Standard TTL circuits – CMOS circuits – TTL to CMOS interface – CMOS to TTL interface – Emitter Coupled Logic circuits - Comparison of CMOS,TTL and ECL performance– PMOS,NMOS and E²CMOS circuits .

Total : 45 hours

TEXT BOOKS

1. Albert Paul Malvino, Donald P. Leech, "Digital Principles and Applications", Sixth Edition, Mc Graw Hill Publishers.
2. Thomas L. Floyd, "Digital Fundamentals" Eight Edition, Pearson Education publishers.

REFERENCES

1. Morris Mano, "Digital Design", Third Edition, Prentice Hall India.
2. Rajkamal, "Digital systems, Principles and Design", Pearson Education.

TEXT BOOKS

1. Jacob. Millman, Christos C.Halkias, 'Electronic Devices and Circuits', Tata McGraw Hill Publishing Limited, New Delhi, 2003.
2. David A.Bell, 'Electronic Devices and Circuits', Prentice Hall of India Private Limited, New Delhi, 2003.

REFERENCE BOOKS

1. Theodre. F. Boghert, 'Electronic Devices & Circuits', Pearson Education, VI Edition, 2003.
2. Ben G. Streetman and Sanjay Banerjee, 'Solid State Electronic Devices', Pearson Education, 2002 / PHI
3. Allen Mottershead, 'Electronic Devices and Circuits – An Introduction', Prentice Hall of India Private Limited, New Delhi, 2003.

MEASUREMENTS AND INSTRUMENTATION

UNIT - 1 INTRODUCTION (9)

Functional elements of an instrument – Static and dynamic characteristics – Errors in measurement – Statistical evaluation of measurement data – Standards and calibration.

UNIT- 2 ELECTRICAL AND ELECTRONICS INSTRUMENTS (9)

Principle and types of analog and digital voltmeters – Ammeters - Multimeters – Single and three phase wattmeters and energy meters – Magnetic measurements – Determination of B-H curve and measurements of iron loss – Instrument transformers – Instruments for measurement of frequency and phase.

UNIT – 3 COMPARISON METHODS OF MEASUREMENTS (9)

D.C and A.C potentiometers - D.C and A.C bridges - Transformer ratio bridges - Self-balancing bridges - Interference and screening – Multiple earth and earth loops – Electrostatic and electromagnetic interference – Grounding techniques.

UNIT - 4 STORAGE AND DISPLAY DEVICES (9)

Magnetic disk and tape – Recorders - Digital plotters – Printers - CRT display - Digital CRO - LED, LCD and dot matrix display.

UNIT - 5 TRANSDUCERS AND DATA ACQUISITION SYSTEMS (9)

Classification of transducers – Selection of transducers – Resistive, capacitive and inductive transducers – Piezoelectric, optical and digital transducers – Elements of data acquisition system – A/D - D/A converters.

TOTAL : 45 hours

TEXT BOOKS

1. E.O.Doebelin, 'Measurement Systems – Application and Design', Tata McGraw Hill Publishing company, 2003.
2. A.K.Sawhney, 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai Co, 2004.

REFERENCE BOOKS

1. A.J.Bounwens, 'Digital Instrumentation', Tata McGraw Hill, 1997.
2. D.V.S. Moorthy, ' Transducers and Instrumentation', Prentice Hall of India Pvt Ltd, 2003.
3. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw Hill, 1995.
4. Martin Reissland, 'Electrical Measurements', New Age International (P) Ltd., Delhi, 2001.
5. J.B. Gupta, 'A Course in Electronic and Electrical Measurements', S.K. Kataria & Sons, Delhi, 2003.